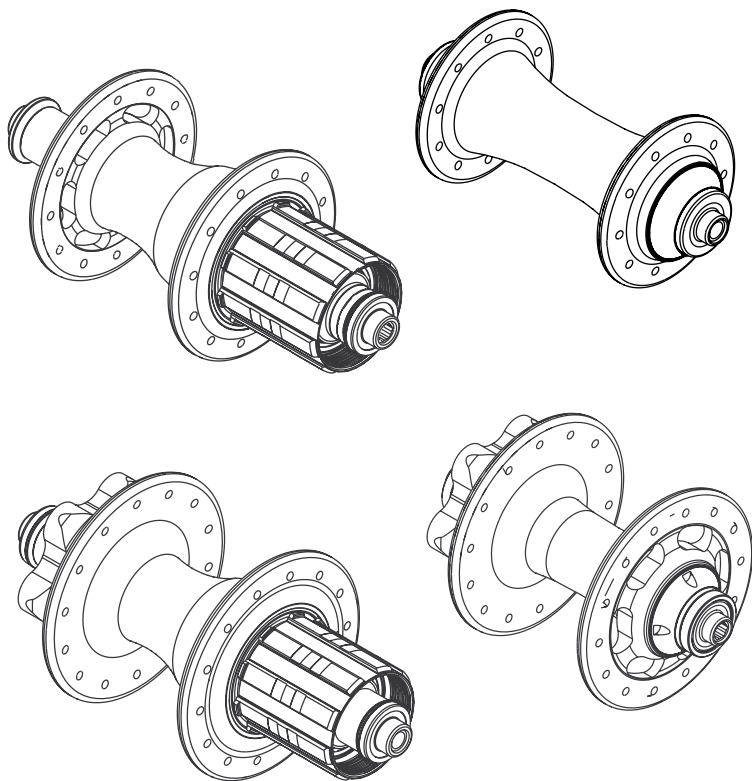


CHRIS KING®
PRECISION COMPONENTS

R45™ & R45™ Disc Hub Manual



5 year warranty
register online
chrisking.com/warranty

serial number



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Helpful tools for precision servicing

Chris King hub cone adjusting tool	
Pen Knife	
2.5mm hex wrench	
5mm hex wrench x 2	
Dental pick	
Small flat head screwdriver	
Chris King Ringdrive Lube	
A light spray lubricant (e.g., WD-40™)	
A quality 10w synthetic oil (such as Mobil 1® 10w-30 or equivalent)	
A lightweight, low viscosity oil, with PTFE (e.g. TriFlow™)	
Bench Vise	

Congratulations

You have just purchased the finest hubs available. With proper care and maintenance you will enjoy many years of the legendary performance you have come to expect from all Chris King Precision Components. This manual is designed to give you the information needed for the setup, use, and basic maintenance of your new hubs.

As with all Chris King Precision Components, our hubs are superbly designed and manufactured, responsibly light, and meticulously finished. Our hubs feature our patented RingDrive engagement system spinning around an aluminum axle on four sets of ball bearings. This combination, housed in an elegant aluminum shell, provides the performance and reliability that serious cyclists demand. Like all of our components, our R45 and R45 Disc hubs are user serviceable.

Cautions

Chris King R45 and R45 Disc hubs are designed to be used in conjunction with quick-release skewers. It is recommended that the skewer develop a minimum of 1100 lbs. of clamping force when set. For best performance, use skewers with steel shafts. Titanium shafted skewers are not recommended.

Do not use thread-locking compound on any part of your hub(s).

For the aluminum driveshells on the R45 rear hubs we recommend using “spidered”-style cassettes. Avoid using individual cog-style cassettes with aluminum driveshells. **We recommend using our aluminum or Ti cassette lock rings when installing 9, 10, and 11 speed drivetrains.**

The Campagnolo-compatible R45 hub uses dedicated cassette lock rings. An 11-tooth lock ring is included with each hub. A 12-tooth cassette lock ring is available from any authorized Chris King dealer, or directly from Chris King Precision Components, www.chrisking.com/store.

Chris King hubs feature adjustable bearing preload. The bearings should be kept in proper adjustment for optimum product performance. Do not allow the adjustment to become loose, as this may cause a loss of performance and could lead to damage to the hubs.

Preparation and Setup

Wheel building

Hub dimensions and restrictions for wheel building are available on pages 12 and 13.

Chris King R45 and R45 Disc hubs are designed to work with 13, 14 and 15 gauge spokes. We will not be responsible for damaged or destroyed hubs, any consequential damages, or any resulting labor costs due to improper lacing of your R45 and R45 Disc hub. Proper wheel building technique is essential in creating a strong wheel. Wheel building is a skill that requires proper training and specialized tools and should be done by a trained professional.

Frame Preparation

Check frame and fork dropouts to ensure that they are parallel to each other. Use an appropriate tool made by a reputable bicycle tool manufacturer.

Unparallel dropouts may damage or compromise the performance of your new hub.

Hub Identification

Two Piece Axle (see Figure 1)

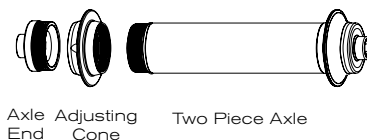


Figure 1

The front R45 and R45 Disc hub uses a two piece axle and adjusting cone to adjust bearing preload and an axle end to lock the preload adjustment. **Two piece axle disassembly, reassembly and adjustment procedures can found on page 5 and 6.**

One Piece Axle (see Figure 2)

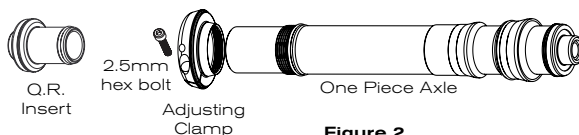


Figure 2

The rear R45 and R45 Disc Hub uses a one piece axle (see Fig. 2, pg.2) and adjusting clamp to adjust bearing preload. **One piece axle disassembly, reassembly and adjustment procedures can be found on pages 6, 7, and 8.**

Setup

R45 and R45 Disc front

Chris King R45 and R45 Disc front hubs are designed to work with 100mm fork drop out spacing. Do not attempt to use your hub with any other dropout spacing.

R45 and R45 Disc rear

Chris King R45 rear hubs are designed to work with 130 frame spacing. Chris King R45 Disc rear hubs are designed to work with 135mm frame spacing. Do not attempt to use your hub with any other dropout spacing. .

The hub(s) come pre-adjusted from the factory. The adjustment has been made anticipating spoke tension and skewer compression. Because of variations in wheel-building practices, **a minor adjustment should be performed upon completion of the wheel build.** See the appropriate "Adjustment" pgs. 6 and 8, and check the hub before using. **Do not modify or alter any Chris King axle system to accept thru-bolt or bolt-on retention devices.**

Break-In

Once your new hub is placed in service, some settling may occur. Check adjustment by clamping wheel into frame with a quick-release skewer. Ride for 5-10 minutes, check for play or binding, and readjust clamp or cone if necessary. Recheck after the first 1-5 hours of riding. Check cassette lock ring on rear hubs after the first 20 hours of use, and tighten if necessary. Continue monitoring for the first 60 hours of use.

During the first 60 hours of use, above average amounts of drag may be noticed. This is normal as the seals break in, and will soon diminish. If this causes chain sag in the rear while back-pedaling, increase the B-tension (cage tension) on the rear derailleur.

A small amount of grease or oil may seep at the bearing seals during the break-in period.

Maintenance

Rear Hub Maintenance schedule

Chris King R45 and R45 Disc Hubs are designed to provide long life and high performance. Beyond an occasional adjustment, the only maintenance necessary is cleaning and lubricating the RingDrive (see “**The RingDrive**”, pg. 8), and re-lubricating the bearings (see “**Service of the bearings**”, pg. 10). Riding conditions will determine how often to service your hubs. As a beginning guideline, **your hubs should be serviced every 6-12 months in normal and dry conditions and every 3 months in wet or muddy conditions.**

The Chris King bearings in your new hub are of the highest quality. However angular contact bearings will settle and eventually wear in with use. Since looseness or “play” in the bearing assembly can develop as a result of wear, Chris King hubs have been designed with an adjustable bearing preload mechanism and any normal play can be eliminated (see the appropriate “**Adjustment**” section, pgs. 6 and 8).

Notes on RingDrive™ maintenance

Normal preventative maintenance of the RingDrive is simple and can be performed using basic tools (see “**The RingDrive**”, pg. 8). In many cases, a minor cleaning and reapplication of lubricant is all that may be necessary. Judging when to perform this basic maintenance is determined by riding style and conditions. As a beginning guideline, your hubs should be maintained every 6-12 months in normal and dry conditions and every 3 months in wet or muddy conditions.

If foreign debris is detectable in the grease and/or the grease looks hard or dry, a complete servicing (removal and cleaning) of the RingDrive should be performed. Complete service includes the removal of the RingDrive engagement mechanism and requires the use of our R45 Hub Service Tool. See any authorized Chris King dealer for complete service or you may purchase a R45 Hub Service Tool Kit from your dealer or directly from Chris King Precision Components. **Chris King Precision Components provides overhaul services at reasonable rates. Contact Chris King Customer Service at 800-523-6008 or email us at info@chrisking.com for details.**

Lubrication

Normal conditions

Lubrication of the R45 RingDrive™

We recommend using a quality 10w synthetic oil (such as Mobile 1® 10w-30 or equivalent) on the RingDrive assembly and helical splines on the driveshell. Oil provides optimal low drag, low viscosity lubrication for our R45 and R45 Disc RingDrive system. RingDrive lube is also acceptable. Do not substitute other brands of grease as they may be too sticky for the helix of the RingDrive and cause hub engagement problems and premature wear.

Cold conditions

To ensure proper engagement in sub-freezing conditions, first be sure that there is no water or moisture inside the hubshell. The hub may require an overhaul to ensure that the hub interior is completely water-free. A quality 10w synthetic oil (such as Mobil 1® 10w-30 or equivalent) works well over a wide range of temperatures, even in subzero conditions. **Do not over fill.**

Wet conditions

Riding in wet conditions necessitates more frequent service. Often this is as simple as removing the axle and driveshell from the hub and removing any moisture from inside the hub shell. This should not replace periodic complete disassembly and maintenance, especially in extreme or prolonged wet conditions. Since it is nearly impossible to seal a hub from water and still have it spin freely, we have designed our hubs to be able to operate normally with some water intrusion. Although the bearings are stainless steel and will resist water-induced corrosion, the lubricant will eventually deteriorate, leading to premature bearing wear and possible failure. High-pressure spray washing, transporting or riding the bicycle in the rain, or submersion in water while riding can all lead to lubricant contamination by water. Be aware of these situations and service more frequently when they occur.

If you have any additional questions, please call our Technical Services Department at 800.523.6008, or check out our web site for tech info and videos: www.chrisking.com

Disassembly of front R45 and R45 Disc hub (see Figure 3)

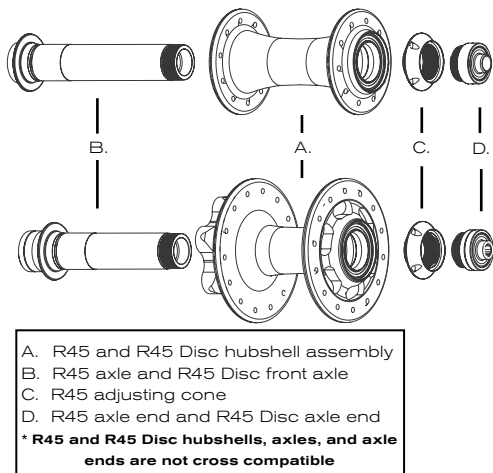


Figure 3

1. Insert 5 mm hex wrenches into both ends of axle assembly.
2. Hold right hand stationary and turn left hand counterclockwise 1/4 turn until assembly is loose.
3. Loosen and unscrew adjusting cone and axle end until they are free from main axle.
4. Slide out main axle.
5. Both hub shell bearing assemblies can now be accessed.

For bearing service information see “**Service of the bearings**”, pg. 8.

Reassembly of front R45 and R45 Disc Hub (see Figure 3)

1. Lightly grease threads on axle, adjusting cone and axle end. Apply two drops of lightweight, low viscosity oil, with PTFE (e.g. TriFlow™) to axle O-rings.
2. Insert main axle into hub shell.
3. If axle end and adjusting cone are assembled as one unit, disassemble by threading axle end out of adjusting cone and apply a thin layer of waterproof grease to the threads.
4. Thread adjusting cone onto the protruding threads of main axle.
5. Lightly snug adjusting cone up to bearing.
6. Thread axle end into adjusting cone until it stops.
7. Proceed to “**Adjustment of two piece axle on front R45 & R45 Disc**”, next.

Adjustment of two piece axle on front R45 and R45 Disc Hub (see Figure 3)

1. Insert 5 mm hex wrenches into both ends of axle assembly.
2. Hold right hand stationary and turn left hand counterclockwise 1/4 turn until assembly is loose.
3. Hold hex wrenches stationary and adjust bearing preload with adjusting cone.
4. Advance adjusting cone until it just contacts bearing, then back off approximately 1/16

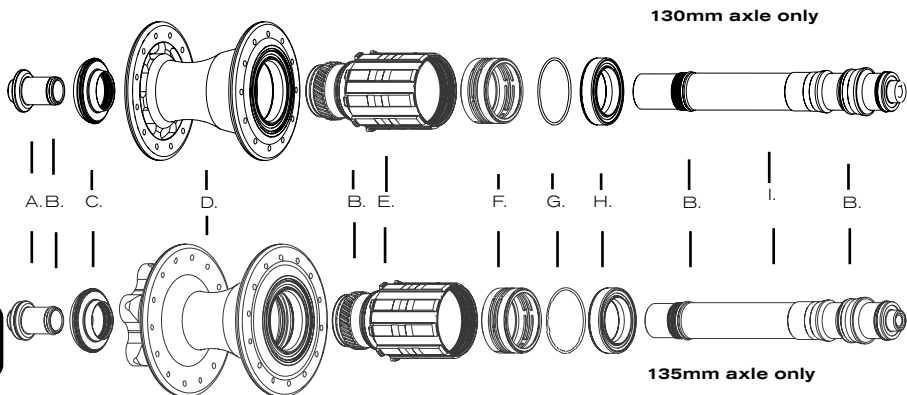
turn (this allows for axle compression while under skewer clamp pressure). For precise adjustment the use of a Chris King Hub Cone Adjusting Tool may be necessary. Hub cone adjusting tools are available from any authorized Chris King dealer, or directly from Chris King Precision Components, www.chrisking.com/store.

5. Once preload is set, tighten axle assembly to **110 inch-pounds (12.4Nm)**.

6. Double check adjustment by clamping wheel into fork with quick-release. Check for play or binding, and readjust if needed.

Disassembly of rear R45 and R45 Disc Hub (see Figure 4)

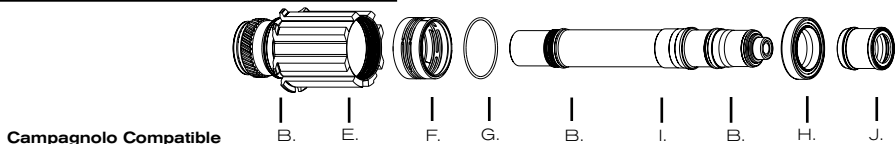
Shimano and SRAM Compatible



- A. R45 or R45 Disc QR insert
- B. O-ring
- C. R45 adjusting clamp
- D. R45 and R45 Disc hubshell assembly
- E. R45 driveshell assembly
- F. R45 bearing spacer spring
- G. Bearing spacer spring O-ring
- H. Outboard driveshell bearing
- I. R45 or R45 Disc rear axle
- J. Bearing retainer sleeve

*R45 and R45 Disc hubshells, axles and axle ends are not cross compatible.

Figure 4



Campagnolo-compatible R45 rear hub

The Campagnolo-compatible R45 and R45 Disc rear hub operates in the same way as the Shimano and Sram compatible R45 hub, with a few differences. The Campagnolo-compatible R45 hub uses dedicated driveshell, non-disc specific axle, disc specific axle, spacer spring, outboard bearing, bearing sleeves and cassette lock rings. An 11-tooth lock ring is included with each hub. A 12-tooth cassette lock ring is available from any authorized Chris King dealer, or directly from Chris King Precision Components, www.chrisking.com/store.

R45 and R45 Disc basic service

R45 and R45 Disc rear hub service

Follow these instructions for a basic cleaning, relubrication, and bearing preload procedure. Refer to the schematics (see figure 4) of this manual for specific part listing.

For a more comprehensive service, including a thorough cleaning, inspection and replacement of parts, and removal of hub bearings, an R45 Hub Service Tool is required. R45 Hub Service Tools are available from any authorized Chris King dealer, or directly from Chris King Precision Components, www.chrisking.com/store.

R45 and R45 Disc rear hub disassembly

1. Remove skewer, cassette lock ring and cassette from hub.
2. Loosen 2.5mm hex bolt on adjusting clamp and then remove R45 QR insert from main axle assembly by pulling it directly out of the non-driveside of axle.
3. Unscrew adjusting clamp and remove it from axle. [Tech Tip: if adjusting clamp is difficult to remove, first insert a 5mm hex key into drive side axle end to keep axle stationary. Then insert a 2.5mm hex key into helper hole on adjusting clamp adjacent to 2.5mm hex bolt. Use 2.5mm hex key as a lever to unscrew adjusting clamp.]
4. Remove axle from the main hub assembly by pushing it through from the non-driveside. [Tech note: The outboard driveshell bearing of the Shimano-compatible R45 may or may not remain on the axle as it is pushed out of the hubshell assembly. It will be remain on the axle in the Campagnolo-compatible version.]
5. Remove driveshell by holding hubshell or wheel in one hand and with other hand pull driveshell counter clockwise out of the hubshell assembly.
6. All rear hub bearing and RingDrive assemblies can now be accessed for basic cleaning and relubrication.

Rear hub basic cleaning

1. Chris King sealed bearings have removable snap rings that hold the rubber seals in place.
2. Carefully, using a very small screwdriver, pick, or penknife, remove the snap ring by inserting tool into split of snap ring. Gently work one end of the snap ring toward bearing center until it is out of its groove. Follow the ring around with the tool until the snap ring is completely dislodged.
3. Lift and remove exposed rubber seal to access the interior of the bearing. Thoroughly

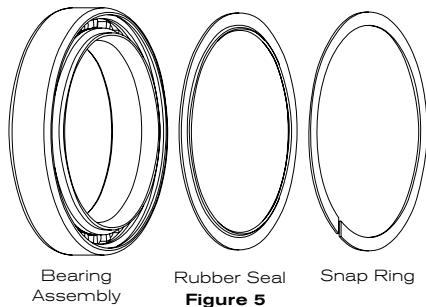
flush the bearing and RingDrive assembly with a light solvent-based spray lubricant (e.g., WD-40™). **Do not use citrus based cleansers as they are corrosive and will damage hub parts.** Some solvents, synthetic lubricants, and greases with high-pressure additives may attack and damage seals and other nonmetallic materials. Minimize exposure to these substances and thoroughly dry hub after cleaning.

4. Using a toothbrush, scrub bearing surfaces, RingDrive splines and teeth, and helical splines on driveshell to remove hardened grease and contaminants.
5. Flush bearing and RingDrive assembly again with a light solvent-based spray lubricant.
6. Use compressed air to blow all spray lubricant, old grease and contaminants out of the bearings and hubshell. If compressed air is not available, use a clean, lint-free towel to thoroughly wipe out interior of hub assembly and bearing surfaces. Bearings, RingDrive and hub interior must be completely dry and free of solvents before adding new lubrication.
7. Wipe dirt and other contaminants from the seals and snap rings. Avoid cleaning the seals with heavy-duty solvent, which could cause deterioration.

Service of the bearings (see figure 5)

Chris King sealed bearings have removable snap rings that hold the rubber seals in place.

1. Carefully, using a very small screwdriver, pick, or penknife, remove the snap ring by inserting tool into split of snap ring. Gently work one end of the snap ring toward bearing center until it is out of its groove. Follow the ring around with the tool until the snap ring is completely dislodged.
2. Lift and remove exposed rubber seal to access the interior of the bearing. [Tech Tip: Carefully note it's orientation.]
3. Thoroughly flush the bearing with a light spray lubricant (e.g., WD-40™) and blow dry.



Note: Some solvents, synthetic lubricants, and greases with high-pressure additives may attack and damage seals and other nonmetallic materials. Minimize exposure to these substances and thoroughly dry hub after cleaning.

4. Wipe dirt and other contaminants from the seals and snap rings. Avoid cleaning the seals with solvent, which could cause deterioration.
5. Lubrication of the R45 bearings. For **R45 bearings with stainless steel balls**, apply enough RingDrive Lube to lightly coat the balls inside the bearing (approximately .3ml) of RingDrive Lube 1/4 to 1/2 way around the top of the hub bearings. For **R45 bearings with ceramic balls**, apply enough RingDrive Lube to lightly coat the balls inside the bearing, using approximately .1ml (a pea-sized amount) of lube. This can be accomplished by applying a light bead of lube 1/8 to 1/4 of the way around the bearing. Rotate the inner race to work the lube throughout the ball area. In wet and/or muddy conditions, apply more lube to the bearings to help seal the bearings from contaminants.
6. Reinstall black rubber seal between inner and outer bearing race. If using the original seal,

reinstall using the same orientation as when they were originally installed, as this will minimize drag.

7. Turn inner race of bearing by hand to test for binding. If bearings do not run smooth, repeat steps 1-7. Binding is often a result of improperly seated seals and/or snap rings.

Used snap rings and seals can be reinstalled unless warped, punctured, or otherwise damaged. If damaged, replacement seals and snap rings are available from any authorized Chris King dealers or directly from Chris King Precision Components. **www.chrisking.com/store**.

Rear hub basic lubrication

1. Apply 1 to 2 mL of 10w synthetic oil on the helical splines between the drive and driven rings by depressing the drive ring spring inside the hubshell assembly.
2. Apply a drop of lightweight, low viscosity oil, with PTFE (e.g. TriFlow [™]) onto O-ring on driveshell, both O-rings on axle and O-ring on QR adaptor.
3. Apply a thin layer of grease onto clean threads on adjusting clamp and adjusting clamp 2.5 mm hex screw.

Rear hub basic reassembly

1. Insert driveshell into the hub shell; turn in a clockwise motion while letting it pull itself in. A distinctive click sound will indicate that the driveshell is firmly seated.
2. If outboard driveshell bearing is separated from axle, slide it onto axle with the black seal and silver snapping facing the driveside and the white bearing retainer facing the non-driveside.
3. Insert main axle, threaded (non-driveside) end first into driveshell. Continue until axle is through the hub and driveside end is firmly seated in driveshell.
4. Thread adjusting clamp onto the protruding threads on the non-driveside of axle.
5. Insert R45 QR insert into non-driveside axle end.
6. Snug adjusting clamp up to bearing.

Rear hub adjustment

The R45 rear hub features an adjusting clamp and bearing spacer spring that maintain proper bearing preload and seating.

1. Secure "L"-shaped 5 mm hex key in vice with shorter end of "L" facing up
2. With non-driveside facing up, insert hub onto 5 mm hex key so that hub can sit freely on vice. If vice is not available, place the hub or wheel onto a flat, firm surface with the non-driveside facing up.
3. Push downward on the hubshell. This **compresses the bearing spacer spring** in the drive shell and ensures proper bearing seating.
4. While maintaining firm downward pressure on the hubshell, tighten the adjusting clamp onto axle until it stops against bearing. Do not overtighten.
5. Once adjusting clamp is in position, tighten adjusting clamp with a 2.5mm hex key to **10 inch-pounds (1.1 Nm)**.
6. Double check adjustment by attaching wheel to bicycle frame. Check for bearing play or binding, and readjust adjusting clamp if needed.

Note: Correct adjustment of the rear hub is necessary for proper engagement of the RingDrive. If the hub is run loose, the RingDrive may not engage properly and could lead to permanent damage of the internal parts and hubshell.

R45 front hub maintenance

Follow “Disassembly, Reassembly and Adjustment of two piece axle on front R45 and R45 Disc hub” instructions on pages 5 and 6. Hub bearings can be lubricated with RingDrive Lube. For bearing service information see “**Service of the bearings**”, pg. 8.

NOTES:

Hub specifications and

Hub Type	Axle Type	Axle Width (mm)	Flange Diameter Drive Side (mm)	Flange Diameter non-Drive Side (mm)
R45 front	two piece	100	39.8	39.8
R45 rear	one piece	130	51.0	51.0
R45 Campagnolo rear	one piece	130	51.0	51.0
R45 Disc front	two piece	100	57.4	57.4
R45 Disc rear	one piece	135	57.4	57.4
R45 Campagnolo Disc rear	one piece	135	57.4	57.4

Frame Attachment Options

QR: Quick release only

Wheel Building Specifications*

Spoke Gauge: 13, 14, or 15 gauge

R45 Spoke Lacing Pattern: Radial lacing is an acceptable pattern for front wheels and the non-drive side of rear hubs. The drive side of rear hubs must be 2-or-more cross

R45 Disc Spoke Lacing Pattern: 2-or-more cross

Spoke Hole Diameter: 2.5mm

Spoke Tension: Should not exceed 120kgf (1200N).

Spoke Tension for Radial Lacing: Should not exceed 90kgf (900N).

*We will not be responsible for damaged or destroyed hubs, any consequential damages, or any resulting labor costs due to improper lacing of your R45 and R45 Disc hub. Proper wheel building technique is essential in creating a strong wheel. Wheel building is a skill that requires proper training and specialized tools and should be done by a trained professional.

wheel building information

Center to Flange Drive Side (mm)	Center to Flange non-Drive Side (mm)	Frame Attachment Options	Available Spoke Hole Drilling	Upgrade & Conversion Options	Weight (grams)	
					Steel	Ceramic
34.8	34.8	QR	16,18, 20, 24, 28, 32	-	103	99
17.0	36.3	QR	20, 24, 28, 32	1	224	218
17.0	36.3	QR	20, 24, 28, 32	-	226 ^{a*}	217 ^{a*}
30.6	22.3	QR	28,32	-	162	158
19.3	34.3	QR	28,32	1	276	271
19.3	34.3	QR	28,32	-	281 ^{a*}	272 ^{a*}

Upgrade & Conversion Options

1. Convertible to Campagnolo driveshell, requires a kit and an axle.

Weight Details

a. Campagnolo hubs come with an 11-tooth lock ring (5.5g).

*Optional 12-tooth lock ring available aftermarket.

Additional Support

Digital videos are available on our web site to better help you keep your hubs, bottom brackets, and headsets performing at their best. Some are narrated by Chris King as he demonstrates proper headset and hub maintenance and overhaul procedures. Check our web site often for updated movies and technical information produced in an effort to help you, our customers, stay on your bike. **Visit:** http://chrisking.com/tech/tech_movies.html

Additional questions? Please email us at info@chrisking.com or call Chris King Customer Service at 800-523-6008. Monday through Friday, 8am - 5pm Pacific time.

Warranty

Chris King Precision Components warrants its hub products to be free from defects in materials or workmanship for a period of 5 years from the original date of purchase. Any Chris King product that is found by Chris King Precision Components to be defective in materials or workmanship will be repaired or replaced at the discretion of Chris King Precision Components providing it is returned to the factory freight prepaid. This warranty does not cover damage or failure resulting from misuse, abuse, alteration, neglect, normal and reasonable wear and tear, crash or impact, failure to perform routine maintenance as instructed, or use other than that for which the product was intended.

If a defect is found, our entire liability and your sole remedy shall be, at our option, free repair or replacement of the Chris King product. Chris King Precision Components shall not be held liable for any indirect, special or consequential damages. The warranty does not cover any Chris King Precision Components product where the serial number has been altered or removed. This written express warranty is in lieu of all other warranties, implied or expressed, and does not cover any representation or warranty made by dealers beyond the provisions of this warranty. This warranty gives you specific legal rights, and you may also have other rights which vary state to state.

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part# 17988 rev. 8/16-A